ARMY MOUNT FOR THE 21st CENTURY

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U.S. dragoon moves alongside column of infantry, 1847.

role. These dragoons tended to be lighter than the heavy mounted units yet heavier and less flexible than the light units. They enabled the commander to take advantage of situations that required a highly mobile infantry but one that he could also use to augment his cavalry.

Although the infantry requirement to accompany tank forces was not yet an issue, the concept of mounted foot soldiers was established. Essentially, more than two centuries before the development of mechanically mounted infantry, a precedent had been established to design mounted infantry units that were lighter than the heavies (*cuirassiers*) yet heavier than the lights.

When the technology of massive firepower became dominant, the commander no longer had the mobility the horse had provided. The mounted infantry role was now to complement armor as part of a combined maneuver team.

An infantry force that could keep up with the tanks and not be destroyed by anything other than the main guns of opposing tanks or direct hits from artillery met this new mounted infantry requirement. Infantry, thus configured, could sustain the momentum of an attack when obstacles or the terrain restricted the tanks' forward movement. The infantry's dismounted assault capability, together with the tank and infantry carrier overwatching and furnishing suppressive fires all the while closely supported by mobile mortars and self-propelled artillery support, offered the best combat organization for forcing penetrations. And then, when the combined mounted force had to pause, the infantry could establish security and prepare defenses.

During World War II, because of the armor force's need for infantry, the carrier's role as a means of allowing infantry to move with armor matured substantially. The tanks were vulnerable in restrictive, broken terrain, and in this environment steady enemy infantry units equipped with an effective antitank weapon often proved deadly to the tanks. (This vulnerability was revalidated in 1956 in Budapest and especially in the 1973 Arab-Israeli War.)

From the 1940s to the 1970s, most armies developed similar responses to their mounted infantry's mobility needs. The general response was a lighter and less expensive vehicle than the tank. Also, trends developed that further specialized the infantry into two branches—one that was oriented toward the heavy force and another that was more of a medium or motorized (wheeled) force. (In this article we focus on the heavy infantry and save discussion of the medium infantry for a later article.)

In fact, by the 1980s, the U.S. Army had developed a doctrine in which the lightness and agility of the infantry carrier were considered component parts of its protection. By using movement techniques properly and by making the most effective use of the terrain, junior commanders could deny the enemy the opportunity to engage their vehicles with his heavier direct fire weapons.

Although this was a reasonable approach, other factors began to intrude upon it. The wire-guided missile, for example, offered a major technological breakthrough for the infantry in the antiarmor battle, and the missile system replaced large-bore cannons for the infantry. Thus, the tank was left as the only direct fire cannon in the maneuver force for ranges under 2,000 meters. Unfortunately, though, tanks were not always present. As infantry carriers worked their way forward and were confronted with field fortifications or well-sited tanks, their light protection and agility did not adequately preserve the vital infantrymen inside them.

Increasingly, tanks became the "roadsters" of the tactical set, often leaving the "smaller" infantry vehicles in the dust across the "occasional" open areas and uncomfortably vulnerable to the enemy's direct fire. Although the smaller infantry vehicles could approach the speed of the heavier ones, their passengers tended to suffer in the process.

Small, light carriers with nothing more than suppressive fire weapons were not the answer. In an attempt to solve the problem, the developers piled increasingly lethal and sophisticated weapon systems onto an increasingly larger frame and paid more attention to protection.

Thus the infantry's mount grew from a lightly armored carrier into a warhorse. In this process, however, demands to continue seeking small size and light weight, along with increased efforts to protect and make the horse lethal (not to mention trying to make it swim), squeezed the infantryman off the saddle. In fact, in the United States where computer modeled analysis became a primary method of supporting decisions on scarce resources, even the role of the infantry in "mechanized infantry" (the U.S. term for this ancient arm) became increasingly subordinate to the improvement in lethal firepower. Theoretically, the weapon systems, when employed at a long range from static or delay positions, were considered superior to tank guns in killing tanks. Such theoretical capabili-

ties, of course, also made the infantry's new mount a priority target.

Like the 19th Century dragoon, the modern dragoon finds himself evolving into something that is not quite mounted infantry. It is interesting to note that the effort at sustaining a hybrid arm with proficient infantry and effective tactical mobility characteristics proved so difficult in the last century that the British establishment, by 1816, had converted all of its dragoons and light dragoons to heavy cavalry, hussars, or lancers. Their infantry function had died, and they had become cavalry.

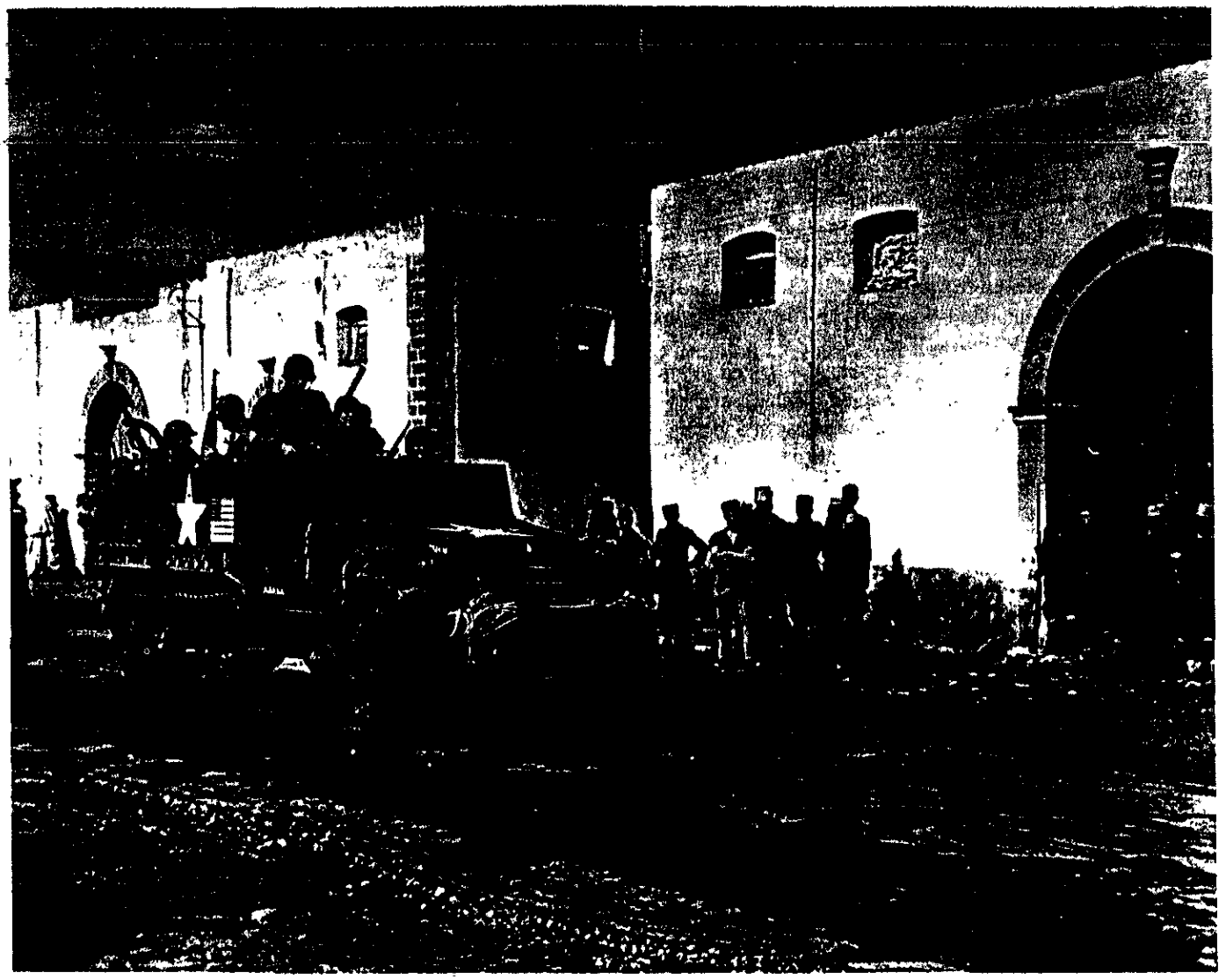
With what we understand of the lethal delivery capabilities of the primary European threat, we begin to question the "light and agile" concept. An analysis of the other possible battlefields for heavy operations (such as Southwest Asia, for example) further reinforces this question of whether a light, agile vehicle is the best way to project the infantry capability into the combined arms heavy team.

When further viewed in terms of large vehicle frames to support more armor, and vehicles with far more powerful drive trains and superior suspension systems (resulting in an improvement in cross-country mobility and survivability), the idea forms that perhaps the vehicle ought to be "tough, hard, and agile." This observation is underscored by the evolving ALB-F concept of a non-linear battlefield and the need for a heavy infantry force that embodies these characteristics. This suggests that the heavy infantry's vehicle needs to be larger and more protected. There are simply too many terrain configurations that inhibit rapid movement or expose the vehicle to the enemy's visual or electronic acquisition.

The Israelis, for example—in both the 1973 war and the war in Lebanon—found that their light carriers were quite vulnerable, even when they used terrain and speed to augment the vehicles' protection.

Is it valid, then, to conclude that we need a heavier and more protected system that insures us the ability to project tough infantry with the heavy force? We found some possible answers during an interview with an Israeli heavy force combat commander concerning light versus heavy carriers for infantry units.

He was an armor officer named Agmon, a colonel at the time, and had served as a combined arms commander at com-



U.S. armored infantry unit, North Africa, November 1942.

pany and battalion level in several high intensity conflicts.

Colonel Agmon considered infantry absolutely essential to success in mounted operations, and said that infantry units must therefore be able to operate with the assault elements of the heavy force. He said that heavy combined arms forces, where successfully employed, had been the main building blocks of success.

During our interview with him, Colonel Agmon made several specific observations:

- He said that infantry forces must be in place and responsive. That means they must be able to keep up with the tanks and survive the same fire attacks.
- He expressed concern at the extensive armament found on the new generation of infantry vehicles. In his view it would be enough to mount a heavy machinegun on the infantry system, and possibly an automatic grenade launcher as well, to support suppression requirements, depending on the organic tanks to provide heavier overwatch and destructive fires. (Colonel Agmon's concept of a battalion heavy mounted force visualizes tanks and mounted infantry organic to the force. Our own views are that a heavy infantry system should have an effective suppression weapon, probably an automatic cannon, that is capable of neutralizing crew-served weapons in hardened positions. We also consider some form of medium antiarmor system necessary to support infantry defense, among other missions. But this system should not compete with the infantrymen for space or with the vehicle's functional design.)
- His ideal infantry vehicle would have the same essential protection and tactical mobility as the tank. When asked for an example, Colonel Agmon pointed to a picture of the Israeli Merkava and said that, minus the turret and with a squad compartment built for "12 to 15 infantrymen," this could be his ideal infantry carrier. (Our view is that this "carrier only" orientation is too restrictive to meet the need for heavy infantry flexibility.)
- Colonel Agmon stressed that his ideal mounted infantry would have not only the protection and tactical mobility of a carrier such as the Merkava but also the esprit and tactical skill of the elite infantry. He said that at the point of battle the mounted force needs such excellence. (We fully concur with the idea of a tough, aggressive infantry that is organic to the heavy force.)
- He strongly supported a vehicle of 35 to 45 tons for the mounted infantry. He pointed out that commanders initially tried to use the M113 in the assault role but that the vehicle proved inadequate for that purpose. Currently, the approach is to use the M113 in a role more along the lines of a combat bus and definitely not for assault. This restriction on employment considerably compromises a commander, because his efforts to keep his combined infantry-armor force together and responsive to each other are less effective. (We generally concur with the idea of a system that is capable of keeping the heavy infantry teamed with the armor—compatible in speed, survivability, and agility.)

As in the past, we may again see the mounted infantry evolve into something else, although in modern guise. Too much concentration on the weapon systems, though, and too little on the heavy infantryman and his role in the heavy force, may create a heavy vehicle that is designed primarily to augment the tank, not to project infantry capability with the ALB-F heavy force.

Historical precedent underscores this concern because of the consistency with which armies over the centuries have thought of their mounted infantry in terms of lightness and, to varying degrees, agility, and then have let it evolve into something else—typically some form of heavy or light cavalry. Critically, a question comes to mind: If the modern heavy infantry is to continue providing an infantry capability for the mounted force, what kind of mount must it have to assure that capability?

Clearly, the lethality that a Soviet-style army, or any competent high intensity heavy force, is capable of projecting shows that the previous levels of protection in carriers have been ineffective. Recent combat experiences of modern armies in heavy mounted warfare appear to validate that conclusion, and the emerging requirements of the non-linear ALB-F battlefield further emphasize this point.

Perhaps the time has come to accept that if we are to sustain a heavy infantry arm and realistically project it into the future, we must develop a carrier that is still agile but heavier and more protected than what we have now.

This suggests a trade-off of a swimming capability for a deep fording capability. (Technologically, with the increase in weight, a swimming requirement is probably not realistic.) It also seems appropriate to consider that by using the terrain to reinforce the vehicle's protection and augmenting this technique by making a vehicle as agile as possible, we may find that a heavier vehicle is not necessarily inconsistent with this approach. If anything, it will increase the vehicle's effectiveness.

The only trade-offs are potential limitations for bridge and river crossings that in Europe may prove manageable with deep fording and improved bridging capabilities. This view becomes more relevant when considered against heavy infantry employment on battlefields elsewhere, as is being suggested by ALB-F, where a river crossing capability would not be as critical.

A future heavy force will need a strong infantry capability, and we must look for ways to assure that capability. Our best indications of the future tell us that protection will be the key to effectively integrating infantry into the heavy force. Thus, it does not seem unreasonable to assume that our future heavy infantry vehicle should have the same, or equivalent, mobility and protection characteristics as the tank.

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